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THE JOINT TACTICAL AIR DIVISION (JTAD) CONCEPT: CLOSE AIR SUPPORT FOR AIRLAND BATTLE

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This monograph concludes with a proposal for a joint force design concept referred to as the Joint Tactical Air Division (JTAD). The JTAD is a joint force design structure, at Army corps, integrating the complementary capabilities of Army and USAF assets.

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ABSTRACT

THE JOINT TACTICAL AIR DIVISION (JTAD) CONCEPT: CLOSE AIR SUPPORT FOR AIRLAND BATTLE by Major Michael R. Rampy, Aviation, 40 pages.

Close air support (CAS) is a vital component of air operations in AirLand Battle. The accelerated tempo and complexity of operations on the extended battlefield requires rapid response from CAS in support of a fluid, complex ground combat situation. This monograph examines CAS doctrine, function, and joint force design from a historical and current perspective. The monograph begins with an analysis of the evolution of CAS in the German military from 1919 to 1945. The German military developed CAS during the Spanish Civil War and introduced it to the world in the early campaigns of World War II in Poland and France. Next, the monograph discusses the United States experience with CAS from 1945 until the present. The issue of joint operations and joint force design between services is the central theme. Comparing and contrasting the German CAS experience with the US CAS experience since World War II yield insights that are applicable to current AirLand Battle doctrine.

Some insights and conclusions derived from this monograph are: joint force design is necessary to reinforce joint doctrine and the missions of close air support (CAS) and battlefield air interdiction (BAI) merge on the fluid, high-tempo modern battlefield. Additionally, successful CAS depends on unity of effort and joint employment flexibility. Unity of effort and joint employment flexibility depend on the use of *mission* rather than *target* oriented air taskings. US Army and USAF CAS assets must work toward the same objective within the framework of the ground commander's intent and scheme of maneuver.

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TABLE OF CONTENTS

SECTION I

DEFINING THE PROBLEM

> The control and use of air will always affect operations; the effectiveness of air operations in fact can decide the outcome of campaigns and battles.[1]

Close air support (CAS) is a vital component of air operations in AirLand Battle. The accelerated tempo and complexity of operations on the extended battlefield requires rapid response from CAS in support of a fluid, complex ground combat situation. The success of CAS in this environment depends on employment flexibility and unity of effort. Flexible employment of CAS depends on the capability to orient on mission objectives rather than a specified target. While contemporary CAS doctrine addresses integration of attack helicopters with fixed-wing aircraft, it orients on target destruction rather than on accomplishment of objectives specified within a mission statement. Additionally, the doctrine advocates "cooperation and coordination" as the primary means to achieve unity of effort between Army and USAF assets. A historical perspective indicates that cooperation and coordination alone are inadequate to ensure joint unity of effort. Current CAS doctrine requires reinforcement by a functionally oriented,

joint force designed to integrate the complementary capabilities of Army and USAF assets in single organizational structure. The joint tactical air division (JTAD) concept fulfills this functional force design requirement.

The German Air Force (GAF) developed modern CAS in the interim period between the two World Wars. While the GAF learned many valuable combat lessons in developing CAS, the single most important lesson was that unity of effort between air and ground forces was paramount in modern combat. The GAF and Army achieved unity of effort by assigning the air and ground units the same mission objectives. Consequently, the supporting air forces oriented on the same mission as the ground forces. As a result, the supporting air forces had the flexibility to attack a variety of targets as long as they remained within the parameters of the ground scheme of maneuver.

The GAF CAS doctrine emphasized centralized control and decentralized execution. Combat experience proved that this method of command and control for CAS was not responsive in supporting ground forces on a high-tempo, fluid battlefield. The GAF experimented with a variety of possible technological and functional solutions. As a direct result of their combat experience with CAS, the GAF decided to develop a functionally designed, joint CAS force to perform the CAS mission. This joint force was the Nahkampf Korps (close air support corps).[2]

A historical perspective indicates an organization is not essential simply because it exists. Successful organizational designs perform specific functional missions recognized as critical to present circumstances. The JTAD is a proposal for a functionally designed, joint organization founded on the principle of unity of effort. The JTAD incorporates attack helicopters, fixed-wing aircraft, artillery and air defense assets in a single organization, similar to the Nahkampf Korps, to simplify command and control and achieve unity of effort in CAS. The functional design of the organization augments current CAS doctrine and is not intended as a replacement for it.

Currently, CAS organization, procedures and force design are under review by Army and USAF agencies. This forthright review is open to new ideas and innovations. James Ambrose, Under Secretary of the Army, recently stated that any reexamination of the current CAS system must focus "not only on equipment" but also on force structure and design."[3] MG John M. Loh, USAF director of Operational Requirements, supports this viewpoint. He states that when you talk about effective CAS the "aircraft is about one-third of the system" while the force design and command and control element contribute the remaining percentage.[4]

CAS requirements in AirLand Battle necessitate a functional rather than a technical solution. While the majority of endeavors to increase CAS effectiveness focus on technology, functional force design contains the solution to

the dilemma. Force design is the organizational design of units to accomplish assigned missions in an effective and economical manner.[5] The time has come to dispense with inter-service issues of secondary importance and concentrate on developing functional force designs to control "primary tactical actions associated with the combat need" such as CAS.[6]

> Since the beginning of warfare, those who focused on functional challenges have invariably developed effective combat solutions.[7]

The purpose of this study is to cause professionals to reflect on history and apply those reflections and insights to current doctrine and force design to meet future challenges. Although combined operations are a distinct possibility in future conflicts, this study limits itself to an analysis of CAS as it impacts on joint Army and USAF operations. Conclusions and implications from this study furnish a departure point for additional review and analysis of combined operations. Furthermore, this study examines the adequacy of historical and existing arrangements for effective joint CAS, offers theory concerning functional force design, and serves as a departure point for further research and thought.

SECTION II

A HISTORICAL PERSPECTIVE OF JOINT CAS DOCTRINE AND FORCE DESIGN: GERMANY 1919-1945

EVOLUTION OF GERMAN AIRPOWER DOCTRINE (1919-1936)

The German Air Force (GAF) experience in World War I established the foundation for the new German Air Force of the 1930's. In World War I the GAF conducted three basic missions in support of ground forces: reconnaissance, protection of Army forces and installations from air attack, and support of ground forces with a rudimentary form of CAS.[8] The Germans developed CAS fundamentals required and experimented with many innovations prior to the end of the war. Through experimentation with command and control for CAS, the GAF developed the Air Liaison Officer (ALO) concept. The ALO, an experienced fighter pilot assigned to infantry divisions in the area of main effort, maintained contact with air forces supporting the action and appraised them of the ground tactical situation. The effectiveness of the ALO concept forged the basis for development of modern CAS.[9]

The positive effect of friendly CAS on the frontline soldiers morale was another significant lesson of the war.

> Visible support given by aircraft to troops in combat action on the ground greatly improved combat morale in a manner unachievable by any other means and often far exceeding the actual material results achieved by air combat action.[10]

The GAF proved its proficiency as a combat arm during World War I. This combat proficiency focused the attention of German military planners on the possibilities for employment of airpower in future conflicts.[11]

Losses in manpower during World War I influenced the German nation physically and emotionally. After the war, the air power theories of Guilio Douhet influenced German airpower enthusiasts. These air power enthusiasts, mostly veterans of WWI experience, advocated Douhet's theories of strategic bombing. They believed Douhet's strategic bombing theories would lead to future "quick, cheap wars."[12] Douhet based his theory of "quick, cheap wars" on the assumption that a strategic bombing offensive would reduce manpower losses by an increased emphasis on materiel and aircraft.[13]

A strategic bombing campaign, as envisioned by Douhet, would shatter the industrial capacity of the enemy and reduce his ability to wage war. Furthermore, a bombing campaign targeted against civilian population centers would reduce the people's will to resist and force an early conclusion of the war. German airpower advocates emphasized the concept of "indirect support" as the primary means to achieve these "quick, cheap wars." Indirect support encompassed bombing of strategic industrial targets and population centers in the enemy's homeland.[14]

Douhet's theories were attractive in concept but required modification in practice to function within German

military and economic constraints. The Germans were constrained by limitations such as industrial capacity, technology of contemporary airpower and time.[15] Although the German strategic bombing advocates could not afford the time required to wage a strategic bombing campaign, they retained some basic principles of Douhet's airpower theories. The incorporation of the element of surprise in an offensive air attack became a keystone of German offensive airpower doctrine. Meanwhile, airpower was steadily rising in importance in the new German concept for war.[16]

Air Field Manual #16, the GAF's primary doctrinal publication, designated support of Army operations through strategic air action as the primary mission of airpower. The ruling requirement for the GAF dictated that all missions "must produce results of decisive importance for the army."[17] Doctrinally, air support missions were split into two major categories: indirect and direct. Indirect support, the primary mission, encompassed striking targets deep in the enemy's rear areas to bring about a decision in the battle area. Direct support, also referred to as CAS, was a low priority "confined to the battle front and the area immediately behind it."[18]

According to Air Field Manual #16, the direct support mission included:

> bombing and strafing of enemy ground forces, tanks, artillery, pillboxes, field defense works, antiaircraft defenses, forward dumps and supply columns.[19]

Air Field Manual #16 divided direct support, or CAS, into two separate sub-missions. The first sub-mission covered CAS for forward combat units while the second sub-mission covered air action to isolate the battlefield. The Germans isolated the battlefield through the attack of enemy communication centers, transportation systems and follow-on forces. These attacks hindered the enemy's ability to conduct the close-in battle and were a critical combat power asset. Although CAS was a doctrinal mission, the GAF's training effort focused on indirect support, the strategically-oriented mission. Consequently, CAS played a minor role in the GAF's doctrine for Army support. The treatment of CAS in Field Manual #16 during the interwar years was evidence of its low priority. CAS was justifiable only when "artillery is unable to fully accomplish its mission."[20] As a result of the primacy of indirect support, the GAF was a strategic air arm with little capability or enthusiasm for CAS. The Spanish Civil War altered the GAF's strategic orientation and had a significant effect on the future of CAS in Germany and the world.[21]

THE SPANISH CIVIL WAR

The GAF of WWII fame evolved directly from combat insights obtained in the Spanish Civil War. The Condor

Legion, a GAF unit, supported Spanish nationalist forces throughout the civil war. The crucible of the Spanish Civil War furnished the GAF with three years of invaluable combat experience and provided an ideal experimental combat laboratory for the development of the modern CAS concept. Furthermore, the experience transformed the GAF from a strategic- to a tactically-oriented force.[22] The GAF prepared for a strategic bombing campaign but faced a tactical ground war. The lack of strategic targets, weakness of the Spanish nationalist artillery, and a maneuver stalemate on the ground forced the GAF to concentrate on delivering CAS to the forward combat units.[23]

In 1936, the "Condor Legion" demonstrated the effectiveness of CAS in the spring offensive against the Basque Republic. Single seat fighter aircraft, previously of limited use in a strategic bombing campaign, bombed and strafed enemy positions close to friendly forward combat units. For the first time in the history of modern warfare, pilots were in radio contact and directed by the combat units they supported.[24] Following this initial experience with CAS, the Germans swiftly developed a more refined system for its employment. The first refinement was the development of Air Signal Liaison Teams (ASLT). The ASLT's furnished CAS pilots with current information on the disposition and intentions of friendly forward combat units in their area. While ASLT's were a source of invaluable information to CAS

pilots they did not have the authority nor expertise to direct CAS missions.[25]

Other improvements in CAS appeared in the form of standardized recognition signals. Forward combat units used these recognition signals to identify their positions to prevent accidental bombing. Along with an improvement in standardized recognition signals came special radio ground attack teams (GATs). These teams of experienced pilots complemented the ASLT's by directing CAS strikes. While there was not a formalized CAS organization during the Spanish Civil War, the ASLT and GAT filled a critical functional combat void. The GAF assigned teams to forward ground units on a mission basis as they were not organic to contemporary force design.[26]

Eventually, the GAF recognized that the theories of strategic airpower advocated prior to the Spanish Civil War were inadequate to contend with the realities of the modern battlefield. In 1939, the GAF modified its air support to incorporate Spanish Civil War combat insights. The Spanish Civil War convinced the GAF of CAS effectiveness and elevated it to a co-equal status with indirect support.[27]

The Spanish Civil War furnished the GAF with crucial information and experience in three areas of CAS. They gained experience in performing CAS in all weather conditions, as well as establishing a functional communications system for CAS. Additionally, the GAF identified a void in their CAS system. Through combat experience, the GAF recognized the

need for a functionally designed, joint force organized specifically to provide effective CAS. The German armed forces considered CAS a vital component of combat power for any future battlefield and placed a new emphasis on it.[28]

THE GERMAN CONCEPT OF CAS IN WWII

The German campaign in France of 1940 introduced the world to a modern, effective CAS system. At the beginning of WWII the Germans possessed the only air force in the world with specific, combat-tested doctrine and procedures for CAS. Additionally, the GAF experimented with joint force design to enhance the CAS mission. The CAS doctrine emphasized joint operations through unity of effort. The ground forces and supporting air forces oriented on accomplishment of a specified mission rather than destruction of a specified target. Mission- oriented orders and air taskings ensured that both ground and air elements attacked the same objectives.[29] A prominent British politician of the period placed in context the German success in France of 1940 by stating that "one of the greatest military victories in history was recently achieved by the German Army and the German Air Force in cooperation."[30]

As a result of combat experience in France, the GAF discovered that CAS encompassed a large segment of "indirect support." The distinction between CAS and indirect support appeared blurred on the fluid, high-tempo battlefields the

Germans encountered in early World War II. While CAS referred to attacks in "close proximity" to friendly troops, indirect support encompassed short-range air interdiction. Short-range air interdiction focused on the destruction of follow-on forces and communication systems which had a near-term effect on the close-in battle. The GAF combat experience indicated that the line between CAS and short-range air interdiction became blurred on a fast-moving, fluid battlefield. Furthermore, their experience revealed that accomplishing these two seemingly diverse missions actually occurred simultaneously. The missions of CAS and short-range air interdiction were "combined in timing but divided in place" of execution. Consequently, GAF doctrine no longer differentiated between CAS and short-range air interdiction. The missions of CAS and short range air interdiction merged into one single mission under the rubric of CAS.[31]

The merging of the CAS and short-range air interdiction missions motivated the GAF to reexamine CAS force design. The realities of the modern battlefield persuaded the GAF to "modify and adjust their organization, cutting their aeronautical coat according to the cloth woven for them by war conditions."[32] The GAF created a functionally designed, joint force specifically to perform CAS; the Nahkampf Korps (close air support corps).[33]

Introduction of the Nahkampf Korps increased the effectiveness of CAS. The Nahkampf Korps consisted of a reconnaissance squadron, a fighter wing, a CAS wing, air

defense and ground defense elements. In addition to performing the CAS mission, the Korps acted as a mobile and flexible Army corps reserve, officially termed the "tactical air support force."[34] While joint cooperation and coordination between the Army and GAF remained crucial in employing CAS, the Nahkampf Korps reinforced that joint cooperation and coordination through a functional force designed to provide effective CAS to forward combat units. A German infantry regimental commander reflecting on the success of joint combined arms operations said "tanks in the lead, artillery in the rear and aircraft overhead-only then will the infantry advance to the attack."[35]

A critical item in the processing of mission-oriented requests was the newly developed air request net. For CAS, joint doctrine stipulated that ground forces determined the basic elements of where, when and what kind of air support was necessary. The ground forces then stated the specific requirement in the form of a mission-oriented request. Battalions processed standard mission requests to regimental level and then to corps for final approval. The air request net was essential in the employment of preplanned CAS.[36]

Although the maturation of the air request net concept enhanced overall CAS flexibility, the primary method for CAS employment was the preplanned mission. At the beginning of WWII, the GAF method for employing CAS consisted only of preplanned missions. Preplanned missions were based on the most updated intelligence available at planning time. This

resulted in rigid execution and the inability of CAS to adjust to the rapidly changing battlefield situation. Consequently, preplanned CAS was inflexible. The GAF developed two supplemental employment methods to improve preplanned CAS.[37]

The "independent" CAS mission allowed ground commanders the flexibility to weight a specific preplanned mission with additional CAS sorties. The ground commander requested the "independent" employment method when the objective of the initial preplanned mission proved difficult to destroy. Ground commanders requested "free commitment" when the possibility of attacking unforeseen objectives arose. The GAF employed "free commitment" most often while exploiting unforeseen success in areas other than the main effort. CAS assets employed in "free commitment" had to adhere to the ground commander's overall scheme of maneuver. The overall control of CAS was the responsibility of a small cell of Army and GAF officers at corps level. This cell had the flexibility to commit CAS assets in an "independent" or "free" mode depending on the dynamic combat situation. The "independent" and "free" modes of commitment significantly improved CAS flexibility.[38]

While the Germans achieved unparalleled success with CAS in the early campaigns of WWII, later years saw a gradual decline in CAS effectiveness. Between 1943 and 1945 the GAF inactivated numerous Nahkampf Korps due to losses in staff and experienced personnel. Consequently, CAS was

increasingly centralized at levels above corps and correspondingly less responsive to the ground commander.[39]

SUMMARY

While the GAF CAS doctrine emphasized centralized planning and decentralized execution, it worked most effectively when planned and executed in a decentralized manner. The GAF discovered, through combat experience, that the optimum means of employing CAS was through decentralized planning and execution. According to Colonel Kusserow, Chief of Air Operations at GAF High Command, practical experience in combat revealed that "direct cooperation between the two locally responsible commands on the spot in the battle area produced the best results."[40]

The merging of CAS and short-range air interdiction missions required the creation of a new joint force design. General Karl Heinrich Schulz, a high level staff officer in the GAF maintained that any centralized command and control structure for CAS above corps level could not be aware of all instantaneous changes in the flow of the battle. Therefore, CAS could not be employed in a "sufficiently quick manner" to be adapted to the "particular exigencies of the situation on the ground with the necessary precision and adaptability."[41]

Consequently, the GAF concluded that in planning and executing CAS, only the "close physical proximity" of

planners and executors at corps level enabled commanders to anticipate, plan, and react to changes in tactical combat situations. Furthermore, there was a critical need for a joint organization and force design at the corps level. GAF combat experience indicated that a highly centralized air command became unfamiliar with the local corps combat situation. This detachment resulted in a lack of responsive and effective CAS.[42]

The GAF identified a combat requirement for a functionally designed, joint CAS force design. This joint force would have "detailed insight into the situation all along the line." Additionally, the joint force would have the authority to command and control both Army and Air forces to conduct "operations commensurate" with the corps and division combat situation.[43]

SECTION III

JOINT DOCTRINE AND THE ROLE OF CLOSE AIR SUPPORT (CAS) IN AIRLAND BATTLE

EVOLUTION OF CAS DOCTRINE

The United States developed modern CAS during the Korean War. At the beginning of the Korean War the USAF was unprepared to fight a conventional war. Consequently, the USAF entered the conflict with "CAS hardware and doctrine

which was little more than a memory of WWII." Although the USAF introduced a new Tactical Air Control System (TACS) late in the war, the USAF's performance proved the Army's long held assertion that CAS was unresponsive to ground commanders.[44]

The war in Vietnam once again found the USAF unprepared to support ground operations in either a conventional or unconventional war. Conventional weapons development for CAS ceased in the years following the Korean War. Equally stagnant was any type of joint doctrinal development.[45] As a partial remedy to this situation, the Army introduced attack helicopters to provide ground commanders with dedicated CAS. The use of Army attack helicopters in a CAS role intensified the debate over which service would have primary responsibility.

During the post Vietnam era, the Army and USAF sought to lessen the intensity surrounding the controversial CAS issue. In May of 1984 the service chiefs of the Army and Air Force signed a joint memorandum known as the "31 Initiatives." The "31 Initiatives" sought to foster joint doctrinal cooperation on a number of issues. As late as 1984 the issue of primary responsibility for the CAS mission remained controversial. Joint Army and USAF initiative #24 addressed service responsibilities in CAS. That the mission of CAS "required affirmation spoke to the traditional distrust the two services felt toward one another on this issue."[46]

Joint initiative #24 gives the USAF primary responsibility for CAS and it urges the Army not to "attempt to acquire or agitate for its own fixed-wing CAS aircraft." Furthermore, it encourages the USAF to "display genuine and effective cooperation and coordination with the ground units they support." The actual mechanism for or degree of "cooperation and coordination" is left to the imagination of the reader.[47] Another significant element of the "31 Initiatives" is affirmation that CAS will play a significant role on future battlefield. Additionally, the "31 Initiatives" recognizes the importance of Army aviation.

> Army Aviation is structured primarily to support Air-Land combat operations by providing a highly mobile combat arm organic to ground forces. Ground commanders command and employ aviation elements in synchronization with other combat arms to achieve assigned ground maneuver objectives.[48]

While the "31 Initiatives" recognizes the importance of Army aviation, it does not address any joint force design to integrate the complementary capabilities of Army and USAF assets.

CAS ON THE MODERN BATTLEFIELD

Contemporary US doctrine for CAS advocates two employment methods; preplanned and immediate. Preplanned CAS, the most deliberate method, requires a minimum of

twenty-four hours between planning and execution. Planning for a preplanned CAS mission requires accurate target intelligence. Consequently, preplanned CAS orients on a target rather than a specific mission. Preplanned CAS is the most inflexible employment method and is of little value in the fluid, AirLand Battle. The ground commander employs immediate CAS when the combat situation is fluid and dynamic. This method of employment is the most flexible as it does not require detailed prior planning and can rapidly adapt to changes in the battlefield situation. Therefore, immediate CAS is the most likely type of mission to be flown in AirLand Battle.[49]

The CAS mission must change in relation to the expansion of the battlefield in time and space. The USAF Tactical Air Command (TAC) and the Army's Training and Doctrine Command (TRADOC) recently completed a joint study concluding that:

> the battlefield of the 1990's will be dominated by Soviet attack strategies centered on fast moving around-the-clock, multi-echelon operations linked to coordinated rear operations designed to disrupt US offensive and defensive moves.[50]

Furthermore, the joint study concludes that, as a result of the fast-moving, expanded battlefield, the "separation between close air support (CAS) and battlefield air interdiction (BAI) will become blurred."[51] BAI missions are "attacks against land force targets which have a near term effect on the operations or scheme of maneuver of friendly

forces."[52] A number of CAS experts support the study's conclusions. Brendan M. Greeley, Jr., maintains that U.S. Army AirLand Battle doctrine, "which emphasizes attacking the enemy throughout the depth of his formation has blurred the distinction between close air support (CAS)" and BAI.[53]

The Chief of the Ground Attack Division, Tactical Air Command feels that:

> Evolving Army doctrine has expanded the battlefield for close air support. Besides the traditional area in the forward line of troops (FLOT), we now must provide support in our friendly rear area and in the deep maneuver area, which could be 150 kilometers into enemy territory.[54]

While current CAS doctrine emphasizes centralized control and decentralized execution, the doctrine for BAI emphasizes centralized planning and execution. BAI planning and execution is an integral element of the overall air interdiction (AI) campaign. The theater Air Component Commander (ACC) is responsible for AI and therefore BAI planning and execution. The "blurring" of the distinction between CAS and BAI is of particular concern to a corps commander.[55]

The corps primary mission in AirLand Battle is the synchronization of a number of critical tactical activities to achieve victory. According to FM 100-15 Corps Operations (Preliminary Draft), today's Corps is the "central point on the air-land battlefield where combat power is synchronized to achieve tactical...advantage over the enemy."[56] One

critical element of combat power the corps must synchronize to achieve tactical advantage over the enemy is CAS and BAI (deep attack). While the corps commander directly controls CAS missions he can only "nominate" targets for BAI missions. The dichotomy in command and control (C2) of CAS and BAI is significant when the distinction between the two missions becomes "blurred."

COMMAND AND CONTROL (C2): CENTRALIZED VERSUS DECENTRALIZED

The fundamental objectives for the command and control (C2) of CAS are to:

> responsively and effectively assign, launch, control, and recover weapon systems engaged in close air support to meet the tactical requirements of the ground forces.[25]

Currently, joint C2 and execution of CAS relies on the Tactical Air Control System (TACS). The TACS functions on the premise of centralized control and decentralized execution. The TACS is a USAF system organized to assist the Army in planning and executing air missions. The TACS consists of an Air Support Operations Center (ASOC), Tactical Air Control Party (TACP), and Air Liaison Officer (ALO). The ASOC's mission is to "plan, coordinate, and direct tactical air operations in support of ground forces." The ASOC, located at corps, assists the commander in the planning and execution of

the air battle. The ASOC is responsible for channeling immediate air requests and nominating targets for BAI.[58]

TACP's, located at division, brigade and sometimes battalion, maintain communication between supporting air and ground forces. The ALO, an integral element of the TACP, "advises and assists the ground commander and requests and coordinates tactical air support."[59] While the TACS emphasizes centralized planning and decentralized execution, reality is somewhat different.

> It is easy to say that airpower is centrally controlled and decentralized for execution, but the various levels of control (Squadron, Wing, ASOC, ATOC, ALO, TACP, etc.) between the aircrew and the target or user make the execution anything but simple.[60]

While a joint CAS command and control system exists, a number of critical issues require resolution. Three critical issues for CAS are; the division of responsibilities between the USAF and Army aviation, the continuing debate over centralized versus decentralized control, and the requirement for a new joint force design. Traditionally, the USAF exercises primary responsibility for providing CAS to the Army. Ground commanders determine the level of involvement for CAS on the battlefield.

> The USAF is in reluctant agreement that the fundamental determinant of its degree of participation in the ground battle is the ground commander.[61]

A recent RAND corporation study on CAS concludes that "there is little doubt" that the Army has established a "de facto role for itself in close air support and that this role is permanent."[62] On any future battlefield:

> the Air Force must be able to provide close air support to the Army units no matter how unfriendly the skies are...and fighters will share airspace with Army helicopters."[63]

A separate Secretary of Defense study concludes that the "Army command and control system for attack helicopters is responsive to the needs of lower unit commanders" and consequently is ideally suited to the CAS mission. Clearly, Army aviation and USAF assets have responsibilities for CAS on the modern battlefield yet intense debate continues regarding optimum command and control arrangements.[64]

The debate centers around how each service views command and control of combat elements. The USAF bases its command and control system on centralized execution and multi-function capability. The Army organizes command and control functions to support unity of effort using decentralized control and execution. Although the USAF contends that centralization of air assets allows for the massing of numbers of aircraft in a specified area, it requires greater response time. Consequently, centralization is not as responsive to the requirements of the ground commander.[65]

Decentralization accrues numerous advantages such as improved response time and the ability to construct force packages to perform specified missions. Decentralization improves response time through the integration of CAS assets into the ground scheme of maneuver. Decentralization enhances mission rather than target orientation. Additionally, decentralization facilitates "force packaging" of units to meet specific CAS mission requirements.[66]

The intense debate over centralization versus decentralization takes on a special significance when considering conditions in AirLand Battle. According to Thomas H. Buchanan, a member of the USAF Air University faculty, the nature of the Soviet threat makes it clear that the "disadvantages of centralized control...outweigh its advantages." Furthermore, centralization of CAS and BAI at the highest levels, such as the ACC:

> may prove to be ineffective in decision making due to either delay, overload or lack of information. This will be especially detrimental in the effort to provide air support to the ground commanders, whose units will be constantly moving.[67]

SECTION IV

CONCLUSIONS

Comprehensive CAS doctrine reinforced by a functionally designed, joint force may well decide the winner in any future mid- to high-intensity conventional war. An analysis of CAS evolution in the Army and the USAF indicates a tendency to relearn this valuable lesson with each new conflict. Current doctrine for close air support planning and execution emphasizes only "consultation and coordination" between the two services. Consultation and coordination alone are inadequate to effectively integrate the complementary and complex capabilities of attack helicopters and fixed-wing aircraft.

The intense debate between the services regarding primary responsibility for CAS impedes progress in joint operations. The salient point is not *who* has primary responsibility for the CAS mission but rather *how* to effectively integrate the complementary capabilities of Army and USAF assets in a joint force designed to provide employment flexibility and unity of effort. Parochial service interests must give way to a joint force designed functionally to perform the specific CAS mission.

The merging of the CAS and BAI missions creates a command and control dilemma for the corps commander. While the corps commander controls CAS, he can only "nominate" or

recommend BAI targets. BAI remains under the control of the Air Component Commander (ACC) in the overall air interdiction (AI) effort. Consequently, while the missions of CAS and BAI merge, current command and control arrangements, in particular the TACS, are inadequate to support them. As a result, a functional gap in command and control of CAS and BAI exists. This command and control gap inhibits unity of effort and employment flexibility.

Successful CAS in the AirLand Battle must orient on the mission rather than on a specific target. Mission-oriented air taskings enhance CAS effectiveness by providing unity of effort and flexibility in CAS employment. With mission-oriented air taskings, air and ground elements share the same objectives within the framework of the ground commander's scheme of maneuver. In a high-tempo, rapidly changing combat situation, mission oriented air taskings are essential for success.

The antiquated argument of centralized versus decentralized command and control of CAS requires updating in light of the dynamic nature of AirLand Battle. Centralized control gives the commander flexibility in synchronizing CAS assets to maximize firepower in a specified area at a specified time. Furthermore, centralization of CAS assets on a fluid battlefield is advantageous if that "centralization" occurs at the correct level of command. The corps is the focal point for tactical combat operations in AirLand Battle doctrine and represents the highest tactical

echelon. At corps level, a functionally designed joint organization to plan and implement CAS reduces the complexity of planning while simultaneously increasing responsiveness.

The expansion of the CAS mission requires the integration of complementary fire support and maneuver elements within the air dimension. While traditional CAS orients on providing fire support on a specified target, the attack helicopter adds a totally new dimension to the mission; maneuver. The attack helicopter significantly increases the employment flexibility of the ground commander. Exploiting the complementary functions of USAF "fire support" and the maneuver capabilities of Army aviation is essential on the modern battlefield. In conclusion, current CAS doctrine requires reinforcement by a functionally oriented, joint force designed to integrate the complementary capabilities of Army and USAF assets in a single organizational structure.

THE JOINT TACTICAL AIR DIVISION (JTAD) CONCEPT: A FORCE DESIGN PROPOSAL FOR JOINT CAS IN AIRLAND BATTLE

INTRODUCTION

> The ultimate solution to our joint generic AirLand warfare doctrine should recognize fundamental criteria for warfighting based on historical fact and procedurally adapted to modern circumstances.[68]

An organization is not necessary simply because it exists. A functional force design is necessary to perform specific missions and tasks recognized as critical to present circumstances. The Joint Tactical Air Division (JTAD), a functionally designed joint organization "procedurally adapted to modern circumstances," performs the specific function of providing effective joint tactical CAS in AirLand Battle.

A functional organizational design must perform contemporary missions and not necessarily those that tradition dictates. The German Nahkampf Korps of World War II, a functionally designed joint force, performed a single function; CAS. The Nahkampf Korps incorporated elements of air defense artillery, ground units and fixed-wing aircraft in a single joint organization oriented on unity of effort and employment flexibility for a high-tempo, fluid battlefield. The Joint Tactical Air Division (JTAD) concept is a proposal for a functionally designed, joint force to conduct CAS in AirLand Battle. Based on the German Nahkampf Korps, the JTAD seeks to provide unity of effort and employment flexibility for modern CAS.

PURPOSE

The JTAD provides unity of effort for CAS, BAI and cross-FLOT operations at Army corps. It achieves unity of effort through a force designed to decrease the span of command and control

while reducing the complexity of coordination required to conduct the modern CAS mission. The JTAD enhances mission rather than target orientation thereby increasing employment flexibility.

The JTAD allows the corps commander employ aviation assets within the framework of the ground commander's intent and scheme of ground maneuver thereby reducing the need for either preplanned or immediate CAS requests. The commander of the JTAD is intimately involved in initial planning of corps missions and has the flexibility to employ JTAD assets within the framework of the overall corps objectives. By drastically reducing the need for preplanned and immediate air requests, the JTAD concept increases responsiveness.

FORCE DESIGN

The JTAD is a division level command organization organic to the corps structure. The commander of the JTAD has the rank and authority commensurate with division commanders. The JTAD consists of four permanently assigned brigade sized commands; artillery, air defense, Army aviation and USAF assets. While a USAF wing command structure is part of the JTAD, there are no USAF aircraft permanently assigned. USAF aircraft arrive at the JTAD under operational control (OPCON) tailored for participation in a specified mission.

The designation of USAF CAS assets as OPCON to the JTAD locates the primary players "in close physical proximity" for

planning and execution. Additionally, the OPCON arrangement facilitates comprehension of the ground commander's intent which is essential in conducting mission oriented CAS.

The JTAD balances the complementary capabilities of rotary- and fixed-wing aircraft in a single organization to provide effective CAS for all corps operations. The integration of artillery and air defense allows the JTAD commander to plan and execute joint suppression of enemy air defenses (J-SEAD). The JTAD is the primary organization responsible for planning and conducting corps deep battle. The J-series corps aviation brigade (CAB) assigned to the JTAD conducts CAS and deep attacks across the FLOT in concert with the corps commanders intent.

ADVANTAGES

The JTAD centralizes CAS assets at corps. CAS sorties are not "sub-allocated" to division level but are kept under the direct control of the JTAD. This centralization allows the JTAD to mass CAS assets at a designated point on the battlefield to achieve the maximum effect. Furthermore, the JTAD employs attack helicopters and USAF fixed wing assets in a tightly cocrdinated air effort to optimize their combat potential. Additionally, JTAD concept provides for a joint organizational design that internally coordinates the essential elements required to provide effective SEAD in support CAS mission as well as corps deep battle.

Streamlining this complex coordination process facilitates responsive and effective CAS.

Combat air operations in AirLand Battle are fought twenty four hours around-the-clock. The JTAD facilitates combat air operations by incorporating USAF assets to fight the day CAS battle and Army aviation assets to fight the night CAS battle. Unity of effort, employment flexibility and centralized command and control for CAS provides ground commanders with responsive, effective, and uninterrupted CAS, both day and night.

Combat is the only true test of the effectiveness for any functional force design. The JTAD concept is one possible solution in providing responsive and effective CAS. A concerted effort is necessary to develop and evaluate new CAS concepts and force designs. In this manner, CAS *will reflect the circumstances of contemporary doctrine and thought.

ENDNOTES

1. U.S. Army. FM 100-5 Operations. (Washington, D.C.,: U.S. Army, 1986)

2. General Karl Heinrich Schulz (trans. Charles E. Weber), "The Collaboration Between the Army and the Luftwaffe: Support of the Army by the Luftwaffe on the Battlefield." (Carlisle:USAWC, 12 December 1947), p.10.

3. (Unsigned) ""Army's Analysis of LHX Helicopters will Omit Close Air Support Issue." Aviation Week and Space Technology (16 February 1987), p.18.

4. Brendan M. Greeley, Jr., "Speed, Stealth, Maneuverability Sought for Survivable Close Air Support." Aviation Week and Space Technology (27 April 1987), p.145.

5. U.S. Army Command and General Staff College, School of Advanced Military Studies, Syllabus for AMSP Course 3 Dynamics of Battles (Ft. Leavenworth: SAMS 1987), p.1.

6. BG (Ret) E.M. Lynch, "Close Air Support: Its Failed Form and Its Failing Function." Armed Forces Journal International (August 1986), p.77.

7. Ibid, p. 77.

8. D. Paul Deichmann, "German Air Force Operations in Support of the Army." (Maxwell AFB: Air University Research Studies Institute, 1962), p.11.

9. Riley Sunderland, "Evolution of Command and Control Doctrine for Close Air Support." (Washington, D.C.,: Office of Air Force History, March 1983), p.2.

10. Deichmann, p.11.

11. Ibid, p.11.

12. Williamson Murray, Luftwaffe (Baltimore: The Nautical & Aviation Publishing Company of America, 1985), p.285.

13. Ibid, p.285.

14. Ibid, p.285.

15. Deichmann, p.12.

16. W.H. Tantum and E.J. Hoffschmidt, The Rise and Fall of the German Air Force, 1933-1945 (Old Greenwich: We, Inc., 1969), p.42.

17. Deichmann, p.123.

18. Ibid, p.x-14.

19. Ibid, p.x-14.

20. Deichmann, p.124.

21. Schulz, p.10.

22. Williamson, p.21.

23. Ibid, p.17

24. Ibid, p.17

25. Shulz, p.13

26. Deichmann, p.131

27. Williamson, p.17.

28. Lee Asher, The German Air Force (New York: Harper and Brothers, 1946), p.211.

29. LTC Kenneth A. Steadman, "A Comparative Look at Air-Ground Support Doctrine and Practice in World War II (Unpublished Report, Ft. Leavenworth: USACGSC 1982), pp.1-2.

30. (Unsigned) "The German Army Cooperation Plan." (Ft. Leavenworth: USACGSC Library, 28 August 1944), p.11.

31. Deichmann, pp. 93-94.

32. Asher, p.19.

33. Schulz, p.10.

34. Ibid, p.10.

35. Deichmann, p.126.

36. James H. Dickinson and Richard H. Kauffman, "Airpower Doctrine: A Case Study on Close Air Support." (Maxwell AFB: Air War College, 1976), p.22.

37. Steadman, p.3.

38. Ibid, p.3.

39. Deichmann, p.17.

40. Ibid, pp. 95-96.

41. Schulz, p.7.

42. Deichmann, p.129.

43. Ibid, p.151.

44. Brooke Nihart, "Sixty Years of Unresolved Problems." Armed Forces Journal (25 April 1970), p.19.

45. Stille, p.52.

46. Richard G. Davis, The 31 Initiatives (Washington, D.C.,: Office of Air Force History, 1987), p.60.

47. Ibid, p.60.

48. Ibid, p.83.

49. MAJ James B. Henderson, Jr., "The "Air" in AirLand Battle," (Ft. Leavenworth: USACGSC, 1982), p.43.

50. Edgar Ulsamer, "New Roadmap for Airland Battle." Air Force Magazine (March 1987), p.108.

51. Ibid, p.108.

52. U.S. Air Force. Tactical Air Command Regulation 55-46 The Tactical Air Control System (TACS), Air Support Operations Centers (ASOC), and Tactical Air Control Parties (TACP). (Langley: HQTAC, 28 November 1986), p. 1-1.
TACR 55-46, p.1-1.

53. Greeley, Jr., p.143.

54. James P. Coyne, "Coordinating the Air-Ground Battle." Air Force Magazine (October 1985), p.67.

55. TACR 55-46, p.1-1.

56. U.S. Army Command and General Staff College, FM 100-15 Corps Operations (Preliminary Draft) (Ft. Leavenworth: USACGSC August 1987), p.1-3.

57. (Unsigned) "Close Air Support," DOD Memorandum from the Deputy Secretary of Defense, Army Aviation (February 1973), p.27.

58. MAJ Thomas H. Buchanan, "The Need for Battle Managers in the Tactical Air Control System." Airpower Journal (Summer 1987), p.61.

59. U.S. Army Command and General Staff College, P030 Combined Arms Fundamentals (Ft. Leavenworth: USACGSC 1986), p.134.

60. Henderson, p.41.

61. MAJ Michael E. Rawlings, "Responsibility for Close Air Support," (Maxwell AFB: Air Command and Staff College, 1973), p.41.

62. Coyne, p.66.

63. MAJ Michael E. Rawlings, p.15.

64. DOD Memorandum from Secretary of Defense, p.25.

65. Ibid, pp.26-27.

66. Ibid, p.27.

67. MAJ Thomas H. Buchanan, p.64.

68. LTC Stephen T. Rippe, "An Army and Air Force Issue: Principles and Procedures for Airland Warfare." Air University Review (May-June 1986), p.66.
LTC Stephen T. Rippe, p.68.

BIBLIOGRAPHY

ARTICLES

Buchanan, MAJ Thomas H. "The Need for Battle Managers in the Tactical Air Control System." Airpower Journal, Summer 1987: 60-71.

Canedy, BG Charles E. "TAC Air: An Army View." Air Force Magazine, February 1978: 56-57.

Coyne, James P. "Coordinating the Air-Ground Battle." Air Force Magazine, October 1985: 64-70.

Futrell, Dr. Robert E. "Airpower Lessons of WWII." Air Force and Space Digest, September 1965: 42-53.

Greeley, Brendan M., Jr. "USAF, Army Grapple with Key Issues of Close Air Support Mission." Aviation Week and Space Technology, 23 March 1987: 50-55.

Hauser, LTC William L. "Firepower Battlefield." Military Review, October 1971: 23-24.

Lynch, BG (Ret) E.M. "Close Air Support: Its Failed Form and Its Failing Function." Armed Forces Journal International, August 1985: 72-77.

Maddox, BG William J., Jr. "The Question of a Separate Branch." Army Aviation, July-August 1971: 10-11.

Mercer, LTC Donald L. "Targeting Soviet Forces." Military Review, May 1984: 24.

Nihart, Brooke. "Sixty Years of Unresolved Problems." Armed Forces Journal, 25 April 1970: 19-24.

Offley, LTC Ron. "Close Air Support for The AirLand Battle." Infantry, September-October 1985: 21-25.

Richardson, LTG William R. "Winning on the Extended Battlefield." Army, June 1981: 36-37.

Rippe, LTC Stephen T. "An Army and Air Force Issue: Principles and Procedures for Airland Warfare." Air University Review, May-June 1986: 60-69.

Stille, LTC Edward O. "Tactical Air Employment: Current Status and Future Objectives." Air University Review, November-December 1967: 50-61.

Ulsamer, Edgar. "New Roadmap for Airland Battle." Air Force Magazine, March 1987: 108-113.

Ulsamer, Edgar. "Streamlining Airpower for Theater Warfare." Air Force Magazine, February 1978: 31.

Weiss, George. "TAC Air: Present and Future Lessons, Problems, and Needs." Armed Forces Journal, September 1971: 36.

Williams, LTG (Ret) Robert R. "Statement made to the Ad Hoc Close Air Support Subcommittee of the Senate Armed Services Committee." Army Aviation, Nov. 1971:4 & 37.

Wiswell, COL Robert A. "The Composite Fighter Wing: A New Force Structure and Employment Concept Needing Logistical Attention." Air Force Journal of Logistics, Summer 1986: 11-14.

"Army's Analysis of LHX Helicopters will Omit Close Air Support Issue." Aviation Week & Space Technology, 16 February 1987: 18.

"Better USAF/Army Coordination Sought." Aviation Week & Space Technology, 6 February 1978: 197-201.

BOOKS

Hart, B.H. Liddell. The German Generals Talk. New York: William Morrow & Co., 1948.

Horne, Alistair. To Lose A Battle: France 1940. Harmondsworth: Cox & Wyman Ltd., 1969.

Lee, Asher. The German Air Force. New York: Harper and Brothers, 1946.

Murray, Williamson. Luftwaffe. Baltimore: The Nautical & Aviation Publishing Company of America, 1985.

Sunderland, Riley. Evolution of Command and Control for Close Air Support. Washington, D.C.,: Office of Air Force History, March 1973.

Tantum, W.H., IV, and Hoffschmidt, E.J. The Rise and Fall of the German Air Force, 1933-1945. Greenwich: WE, Inc., 1969.

GOVERNMENT PUBLICATIONS AND MANUALS

Davis, Richard G. The 31 Initiatives. Washington, D.C.,: Office of Air Force History, 1987.

Department of Defense. JCS Pub. 1 Dictionary of Military and Associated Terms. Washington, D.C.,: The Joint Chiefs of Staff, 1 January 1986.

U.S. Army TRADOC Air Land Bulletin #87-1. Ft. Monroe: TAC-TRADOC ALFA, 31 March 1987.

U.S. Army. TRADOC Pam 525-8 General Operating Procedures for Joint Attack of the Second Echelon (J-SAK). Fort Monroe: TRADOC, 31 December 1984.

U.S. Army Command and General Staff College. Syllabus for AMSP Course 3 Dynamics of Battles. Ft. Leavenworth: School of Advanced Military Studies, 1987.

U.S. Army Command and General Staff College. FM 100-15 (Preliminary Draft) Corps Operations. Ft. Leavenworth: USACGSC, 1987.

U.S. Air Force. AFM 1-1 Basic Aerospace Doctrine. Washington D.C.: USAF, 16 March 1984.

U.S. Air Force. TAC Regulation 55-46 The Tactical Air Control System (TACS), Air Support Operations Centers (ASOC), and Tactical Air Control Parties (TACP). Langley: Headquarters Tactical Air Command, 28 November 1986.

U.S. Army. FM 1-100 Combat Aviation Operations. Washington, D.C.: U.S. Army, 1984.

U.S. Army. FM 1-111 Aviation Brigade. Washington, D.C.,: U.S. Army, August 1986.

U.S. Army. FM 1-112 Attack Helicopter Battalion. Washington, D.C.,: U.S. Army, July 1986.

U.S. Army. FM 100-5 Operations. Washington, D.C.,: U.S. Army, 1986.

U.S. Army Command and General Staff College. P030 Combined Arms Fundamentals. Ft. Leavenworth: USACGSC, 1986.

UNPUBLISHED DOCUMENTS

Breckenridge, Lacy W., Girling, Wallace D., and Tucker, Roger D. "Close Air Support: Concepts and Doctrine." Maxwell AFB: Air War College, 1972.

Dickinson, James H. and Kauffman, Richard H. "Airpower Doctrine: A Case Study on Close Air Support." Maxwell AFB: USAF Air War College, 1976.

Diechmann, D. Paul. "German Air Force Operations in Support of the Army." Maxwell AFB: Air University (Research Studies Institute), 1962.

Fraser, MAJ Harry. "Integration of Close Air Support and Army Aviation on the 1980's Battlefield." Maxwell AFB: Air Command and Staff College, 1978.

Greenfield, Kent Roberts. Study #35 "Ground Forces and the Air-Ground Battle Team: Including Organic Light Aviation." Historical Section-Army Ground Forces, 1948.

Henderson, MAJ James B. "The "Air" in the Airland Battle." Ft. Leavenworth: Command and General Staff College, 1982.

Packett, MAJ Virgil L. II. "Airmechanization: The Direction and Dynamics of Army Aviation from a Combined Arms Perspective." Ft. Leavenworth: MMAS, USACGSC, 1985.

Rawlings, Michael E. "Responsibility for Close Air Support." Maxwell, AFB: Air Command and Staff College, May 1973.

Rippe, MAJ Stephen T. "An Army and Air Force Issue: Principles and Procedures for AirLand Warfare: A Perspective of Operational Effectiveness on the Modern Battlefield." Ft. Leavenworth: MMAS, USACGSC, 1985.

Sautter, Melvin H. "Principles for the Control of Air Support Assets Over Joint Land Combat Operations." Maxwell, AFB: Air War College, April 1972.

Schulz, GEN Karl Heinrich (trans. Charles E. Weber: Report of POW Interrogation) "The Collaboration Between the Army and the Luftwaffe: Support of the Army by the Luftwaffe on the Battlefield." Carlisle Barracks: USAWC, Military History Institute, MS #B-791, 1947.

Steadman, LTC Kenneth A. "A Comparative Look at Air-Ground Support Doctrine and Practice in World War II." Ft. Leavenworth: Combat Studies Institute, 1982.